

CURRICULUM CONNECTIONS

A Guide to Using NatureWILD Magazine with your class

Winter 2017: Secrets of Sleep, Super Slime, Fishy Facts & more...



All animals sleep, yet what do we really know and understand about the meaning of “catching our ZZZs”? How do our sleep patterns compare to how our animal relatives manage sleep in the wild? How are sleep and hibernation related?

Grade: 5 **Subject:** Science, Physical Education & Health, with language extensions

THE SECRETS OF SLEEP

(PAGES 8 & 9)

Big Idea: > Multi-cellular organisms have organ systems that enable them to survive and interact within their environment (Gr. 5 Science)
> Understanding ourselves and the various aspects of health helps us to develop a balanced life style (Gr. 5 Physical Ed. & Health)

Core Competency

Personal Awareness and Responsibility:

- > I can participate in activities that support my well-being and health and tell/show how they help me
- > I can sustain a healthy, balanced life style

Curricular Competency:

- > Identifying patterns and connections in data
- > With support, plan appropriate investigations to answer questions
- > Describe the impacts of personal choices on health and well-being

Content:

- > Basic structures and functions of body systems
- > Practices that promote health and well-being including those that prevent communicable and non-communicable diseases

Teaching Idea

1. After Reading **The Secrets of Sleep**, read the article, **Dr. Eucan Doowitt explores Hibernation**, on pg. 7. After completing the experiment, create a Venn diagram comparing and contrasting the concepts of sleep and hibernation. Include which organ systems are involved in each.
2. Using the animals (including humans) mentioned in the article, create a graph comparing how many hours of sleep each typically gets in a day. (Extend with 2-3 animals that interest you).

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Secrets of Sleep (cont'd)

3. Explore the positive and negative actions that influence healthy sleep patterns by interviewing family members. Design a strategy/experiment that is intended to improve/enhance sleep patterns, and report on your findings after implementing your strategy.
4. Extend the article by researching the sleep habits of other animals explored in this issue (variety of fish, slugs, etc.).
5. Create your own crossword using the theme of "How sleep influences personal health".

Extensions:

1. Create a NatureKids 10 Step Guide to Healthy Sleep Routines (brochure, video, poster, song flip book, etc.).
2. Create an "A-ZZZ" book on what you have learned about sleep.

Sample Rubric for Scientific Investigations:

http://r2ed.unl.edu/CSI/dissemination/downloads/educator/unit_lesson_plans/inquiry_rubrics_teaching_resources/rubrics/student_inquiry_rubric.pdf

Sample Rubric for Information Guides:

<http://teacherweb.com/CA/RooseveltMiddleSchool/GeneticDiseaseWebQuest/brochurerubric.pdf>

Gooey, slippery slime

what is it, who makes it, where do you find it, why is it useful?

SUPER SLIME

(PAGES 10 & 11)

Grade: 1 Subject: Science

Big Idea: Matter is useful because of its properties.

Curricular Competency:

- > Questioning and predicting (all)
- > Planning and conducting (all)
- > Processing and analyzing data and information
 - Compare observations with predictions through discussion

Content:

- > Specific properties of materials allow us to use them in different ways

Super Slime (cont'd)

Teaching idea:

1. Teach students the properties of solids, liquids and gases. Some ideas for teaching these concepts can be found at:
<http://mrstfirstgrade-class-jill.blogspot.ca/2011/12/states-of-matter.html>
There are some useful blackline masters at the end of this teaching guide:
<https://www.lernerbooks.com/SiteCollectionDocuments/TeachingGuides/9780822568834.pdf>
2. Make some Oobleck and give students time to play with it. Make enough for each small group to have some. Discuss whether it is a solid or liquid and how it acts like both. If possible, do the discovery and experimenting with Oobleck outside as it can be challenging to clean up.
3. Students predict in small groups what would happen if they:
 - tried to push a Lego person (or some other small, interesting object) into the Oobleck.
 - left the Lego person on top of the Oobleck?
 - slowly wiggled the Lego person into the Oobleck?One student records the predictions.
4. Students test their predictions and record the results.
5. Discuss with students what use a material like Oobleck could have. Shear thickening fluids (of which Oobleck is one example) have a number of practical applications such as sports and personal protection and body armour. It could make body armour that is flexible but acts as a solid if it gets hit (by a baseball, lacrosse ball, hockey puck, for example).

Note: Dispose of Oobleck in garbage bags, do not put it down the sink!

Links:

<http://news.cornell.edu/stories/2015/11/secret-oobleck-revealed-last>

http://firstgradefanatics.blogspot.ca/2011/12/were-all-about-matter-around-here_10.html

<http://adayinfirstgrade.com/2013/02/states-of-matter.html>



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WHY ARE FISH SHAPED THE WAY THEY ARE? (PAGE 4 & 5)

Fish shapes have evolved to help them survive in the many different niches present in the fresh and salt water ecosystems on earth. Use this article to spark students' interest in adaptations, fish physiology and how the shape of a fish can tell you something about that fish's habitat.

Grades: 4 Subject: Science

Big Idea: All living things sense and respond to their environment.

Curricular Competency:

- > Evaluating
 - Demonstrate an understanding and appreciation of evidence
- > Applying and Innovating
 - Co-operatively design projects
- > Communication
 - Represent and communicate ideas and findings in a variety of ways, such as diagrams and simple reports, using digital technologies as appropriate

Teaching idea:

Using the information learned from the article and some added research from the website listed below, have students choose a fish to build out of plasticine and create a habitat for them based on their body shape and other adaptations.

http://dornsife.usc.edu/assets/sites/291/docs/IslandExplorers_U2_L5.pdf

FISHY FACTS AND FUNNY NAMES (PAGES 12 & 13)

Have some of your burning questions about fish and their physical features answered in this article.

Grade: 4 Subject: Language Arts

Big Idea: Exploring stories and other texts helps us understand ourselves and make connections to others and to the world.

Curricular Competency:

- > Comprehend and Connect
 - Access and integrate information and ideas from a variety of sources and from prior knowledge to build understanding.
- > Create and Communicate (writing, speaking, representing)
 - Use writing and design processes to plan, develop and create texts for a variety of purposes and audiences.
 - Transform ideas and information to create original texts.

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Fishy Facts and Funny Names (cont'd)

Content:

- > Story/text
 - Evidence
- > Strategies and processes
 - Reading strategies, metacognitive strategies, writing processes

Teaching idea:

Have students brainstorm questions they have about other animals, plants or parts of nature that they would like to know the answers to.

Have each student research the question to find an answer and then make their own question/answer card with an image of the organism or natural feature in question.

This can be used as a class deck of "fact cards" to be used when the class has a few minutes to fill. Questions are asked of the class and they try to answer them (except for the student whose card is being used of course).

Using simple and easily available low-cost light sticks students can explore how temperature affects the rate of a reaction and partially explains why animals hibernate in the winter.

DR. EUCAN

Grade: 4 Subject: Science

DOOWITT

Big Idea: Energy can be transformed.

EXPLORES

Curricular Competency:

HIBERNATION

- > Planning and conducting
 - Collect simple data
- > Evaluating
 - Make simple inferences based on their results and prior knowledge
 - Reflect on whether an investigation was a fair test

(PAGE 7)

Content:

- > Energy is needed for life
- > Sensing and responding- other animals
- > The effect of temperature on particle movement

Teaching idea:

It is a big leap for young children to understand how heat affects molecular movement and, therefore, the rate of chemical and physical reactions. Perhaps the best way is to allow children to see for themselves the results of increasing or decreasing temperature on simple materials.

Dr. Eucan Doowitt Explores Hibernation (con'td)

The exercise within the Winter 2017 NatureWILD uses light sticks to show how the rate of reaction changes with temperature. A simple analogy might be the effect of hot or cold water on dissolving a hard candy. Children can work in pairs for this activity.

You need:

- Heatproof paper cups (2 per pair of children)
- Stir-sticks (Coffee shops may give you a class set of cups & stir-sticks free).
- Bag of coloured hard candies made of coloured sugar (as small as possible so that candy dissolves fairly quickly)

First help the children understand the need for a 'fair test'; This means each pair choosing two candies that are 'the same' (same size, shape, and colour).

Then ask if the amount of water used will need to be 'controlled' also. After they have understood and know the importance of the water amounts being equal in each cup, mark the inside of the cup with a pointed permanent Sharpie. Use a cardboard measure you have prepared to ensure each cup will hold the same amount. The cup should be about 3/4 filled.

You now need to discuss the two temperatures of water you will use.

Hot water: For hot water I suggest using a kettle but ensure the temperature is not hot enough to hurt the children. Do not pour the water into a cup that is being held by a child. Put the cup down, fill it, and the child can carry it away. Make sure the water comes up to the black mark. A slight difference is OK.

Cold water: I recommend a jug of tap water with ice cubes so the temperature is as cold as possible. The children can pour the cold water. Make sure they know they must pour only to the black mark.

Each pair will have one cup of hot water and one of cold water. Each child will drop one candy into a cup and begin stirring gently. Ask them to check each other's cup regularly and observe what is happening.

At the conclusion of the experiment, have the children say what happened and what caused the difference. Ask them about how they see heat being used to change foods they eat and other examples of heat helping things to dissolve. Try some other comparisons - tea bags, hot chocolate, even 1/2 teaspoons of salt. As heat is defined as the rate of molecular motion you can see how it helps hibernating animals to exist on their fat reserves by not 'burning' them too fast!

As with all these investigations, do it yourself in advance to ensure it works.

The experiment in NatureWILD is a qualitative experiment in that the students are using their eyes to check brightness of light emitted while this experiment can be made into a quantitative experiment by recording the elapsed time the candies take to dissolve.